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THE REGULATION OF ANIMAL RESEARCH  
AND THE EMERGENCE OF ANIMAL ETHICS:  
A CONCEPTUAL HISTORY

**ABSTRACT.** The history of the regulation of animal research is essentially the history of the emergence of meaningful social ethics for animals in society. Initially, animal ethics concerned itself solely with cruelty, but this was seen as inadequate to late 20<sup>th</sup>-century concerns about animal use. The new social ethic for animals was quite different, and its conceptual bases are explored in this paper. The Animal Welfare Act of 1966 represented a very minimal and in many ways incoherent attempt to regulate animal research, and is far from morally adequate. The 1985 amendments did much to render coherent the ethic for laboratory animals, but these standards were still inadequate in many ways, as enumerated here. The philosophy underlying these laws is explained, their main provisions are explored, and future directions that could move the ethic forward and further rationalize the laws are sketched.

**KEY WORDS:** animal ethics, animal experimentation, animal laws, animal research regulation, animal research ethics

HISTORICAL-CONCEPTUAL BACKGROUND

The history of the regulation of animal research is essentially the history of the emergence of a meaningful social ethic for animals in society. For virtually all of western intellectual history there were almost no discussions of ethical obligations towards non-human beings with the exception of the writings of some isolated thinkers such as Plutarch, Schopenhauer, and Bentham.<sup>1</sup> Even more important, there was virtually no legislative history of constraining actions towards animals, with the exception of the prohibitions against overt cruelty, which are clearly expressed in the Old Testament, defended by Thomas Aquinas during the Middle Ages, and encoded in the laws of western societies beginning in roughly 1800.<sup>2</sup>

These anti-cruelty ethics and the laws mirroring them, particularly in their medieval and modern incarnations, moreover, did not por-

tray animals as direct objects of moral concern, instead focusing on the indirect effects of cruelty on humans. Aquinas and Kant were quite explicit in forbidding animal cruelty on the grounds that if such behavior was condoned in society, the perpetrators would be likely to advance to abuse of humans, a psychological insight buttressed by three recent decades of research. On such a view, if a person demonstrably would not graduate to hurting people, presumably animal cruelty would not be morally problematic. Indeed, if it were known that sadistic urges towards other people could be expunged by engaging in animal cruelty, presumably such actions could be construed as obligatory!

In the nineteenth century, it became apparent that society interpreted the anti-cruelty laws in the same Thomistic way. In one revealing case in nineteenth century Missouri, a man was charged with cruelty after throwing pigeons into the air and shooting them to demonstrate his skill. After killing the birds, he ate them. The court ruled that the pigeons were not “needlessly or unnecessarily killed,” because the killing was done “in the indulgence of a healthful recreating during an exercise tending to promote strength, bodily agility and courage.”<sup>3</sup> In discussing a similar nineteenth century case of a tame pigeon shoot in Colorado, the court affirmed that “every act that causes pain and suffering to animals is not prohibited. Where the end or object in view is reasonable and adequate, the act resulting in pain is...necessary and justifiable, as...where the act is done to protect life or property, or to minister to the necessities of man.”<sup>4</sup> To the credit of the Colorado Court, it did not find that such tame pigeon shoots met the test of “worthy motive” or “reasonable object.” Even today, however, there are jurisdictions where tame pigeon shoots and “canned hunts” do not violate the anti-cruelty laws.

Part of the historical reason for the poverty of animal ethics, be it theoretical or social, lies in the nature of traditional animal use. The use of animals was overwhelmingly agricultural: food, fiber, locomotion, and power. And the key to agricultural success was good husbandry—putting the animals into the optimal conditions they needed to thrive, and then augmenting their natural survival skills with food during famine, water during drought, protection from predation and extremes of weather, and so on. This generated a happy symbiosis, wherein both human and animal partners to this ancient contract did well if and only if the other did well. A sanction far stronger than social ethics—self-interest—underwrote the

husbandry relationship.<sup>5</sup> The cruelty laws were there to cover the minority of people who were either sadists or heedless of self-interest.

It is only in the mid-twentieth century that the stage was set for social demand for animal ethics, and even then in a halting and ambiguous fashion. Two factors created this demand. First, husbandry-based animal agriculture was superseded by industrial agriculture, the application of industrial methods to the production of animals. Instead of putting round pegs in round holes and square pegs in square holes as in husbandry, “technological sanders” allowed us to force square pegs into round holes, and to sever the link between productivity and animal happiness. Antibiotics, vaccines, air-handling systems, and other tools allowed us to keep animals profitable while miserable.

Second, the mid-twentieth century also witnessed the rise of massive amounts of animal research funding with the founding of the NIH and the development of large amounts of toxicity testing. Here again was a new and significant use of animals in which animal welfare was no longer assured by the nature of that use. Animals were harmed for human (and animal) benefit, with no compensatory benefit to the animal subjects. Yet no social ethic or regulation existed to assure that such suffering was minimized, even when its presence was unnecessary or counterproductive to the purposes of the science.

### THE ANIMAL WELFARE ACT OF 1966

As a movement, anti-vivisectionism—moral objection to invasive animal research—traces back to the beginnings of modern animal research. Arguably, Descartes’ successful depiction of animals as organic machines lacking sentience laid the groundwork for significant experimentation on animals in terms of anatomy and physiology. The Port Royal Abbey in France pioneered in vivisection. This sort of work in turn sparked significant opposition, particularly in Britain, with the forces opposed to animal research generating sufficient political clout to bring an anti-vivisection Bill to the House of Lords in 1875. After much testimony and controversy, the Parliament passed the Act of 1876 (Cruelty to Animals Act), which restricted some uses of animals in research and teaching and set up a system of licensure and certification governing the use of animals in British science.<sup>6</sup>

No such movement of similar political clout developed in the United States. The closest relevant concern was over pound seizure, via a series of state laws enacted paralleling the rise of significant amounts of animal research after World War II, which allowed research laboratories to obtain animals from pounds to use for experimentation. Though such laws elicited much opposition, some are still extant. Other states have prohibited even the use of dead pound animals in research.

In general, the biomedical research community successfully countered any legislative intrusion into the research process from World War II until the 1960's, cannily portraying animal research as a scientific necessity, not as an ethical issue, and portraying those who raised moral questions about animal research as misanthropes unconcerned about human health, "animal lovers and people-haters." As we shall shortly discuss, this view was not merely a cynical political posture, but in fact an ideology widely accepted in the biomedical community.

In the mid-1960's, however, two events took place that made it politically necessary for Congress to address animal research, at least on a superficial level.

Here is the first incident, as described in official United States Department of Agriculture (USDA) history:

In July 1965, a Dalmatian named Pepper disappeared from her backyard and was later spotted by a family member in a photograph of dogs and goats being unloaded from a Pennsylvania animal dealer's truck. The family discovered that Pepper had been sold to a dog dealer in New York State. When the family confronted the dealer, they were refused entry onto the property.... Events led to a telephone call to Congressman Resnick's office in the District where the dog dealer was located. However, even Mr. Resnick's intercession failed. Angered by the dealer's refusal to admit the family, Congressman Resnick decided to introduce a bill to prevent such wrongs. Pressure from the Pennsylvania State Police led to an admission that Pepper had actually been sold to a hospital in New York City. In the end, Pepper had been used in an experiment and was euthanized. Pepper's disappearance, however, had galvanized several members of the House and Senate to introduce legislation to prevent future incidents.

Congressman Resnick's bill was introduced in the House and required that dog and cat dealers and the laboratories that purchased them be licensed and inspected by the U.S. Department of Agriculture, and required to adhere to humane standards established by the Secretary of Agriculture. Similar legislation was introduced in the Senate and co-sponsored by Senator Warren Magnuson and Senator Joseph Clark.

According to Senator Magnuson:

“The Committee on Commerce opens the first of two days of hearings this morning on a question which is of very great concern to millions of Americans: The protection of the pet owner from loss of the pet through theft and the assurance that animals in the hands of dealers will be humanely treated.

I would like to emphasize that the issue before us today is not the merits or demerits of animal research. We are interested in curbing petnapping, catnapping, dognapping, and protecting animals destined for research laboratories, while they are in commerce. We are not considering curbing medical research.

I have always considered myself a friend of the medical researcher. Yet, we do not think we can allow the needs of research, great as they may be, to promote either the theft of a child’s pet or the growth of unscrupulous animal dealers.”

From their introduction, both bills faced opposition. However, another event was about to occur that would make it harder for the legislation to fail. While hearings on the House bill were being held by Congressman W.R. Poage, Chairman of the House of Agriculture Committee, an article appeared in *Life* magazine with photographs taken by Stan Wayman during a raid by the Maryland State Police, documenting the abuse of dogs in a dealer’s facility. The resulting public outcry led opponents of the legislation to modify their stand and to attempt to seek exemptions for research facilities rather than complete defeat of the legislation. Although both the House and Senate bills were initially weakened by exemption for laboratories, Senator Mike Monroney prepared an amendment that restored coverage of laboratory animals. Despite attempts made to defeat this amendment, newspapers throughout the country offered editorial support for the Monroney amendment. In the end, the Senate Commerce Committee bill was passed by the Senate and sent to President Johnson who signed the bill into law on August 24, 1966. The bill became Public Law 89-544.<sup>7</sup>

It is essential to note that we are not even close to dealing with rational animal ethics in this legislation. The unabashed reasons for these laws are protection of human sensibilities—concern that their beloved possessions, their pets, not be dognapped or catnapped and end up in experiments—and calming public hysteria. Furthermore, Wayman’s photographs struck at the heart of American’s love for dogs. In particular, his stark nighttime photo of an emaciated greyhound, little more than a bag of bones, held by a dealer, was bound to galvanize a major emotional response.

When one looks at this legislation from the point of view of rational ethical content, one is appalled. As I tell my students, if I were to assign writing a law to a freshman class in animal ethics and received this 1966 document, I would unhesitatingly fail the students who wrote it. First of all, the Act defines “animals” in research as “live and dead dogs, cats, monkeys (nonhuman primate animals),

guinea pigs, hamsters, and rabbits.” Specifically excluded under the regulations promulgated were mice, birds, farm animals, and horses used for food and fiber research. Given that rats and mice were estimated to comprise over 90% of the animals used in research, this was hardly a comprehensive research animal welfare act.

In addition, the regulations state that “animal” shall mean, in addition to the animals listed above, any “other such warm-blooded animal as the Secretary [of Agriculture] determines is being used, or is intended for use, for research, testing, experimentation....” The absurdity is patent. The law authorizes the secretary to determine (that is, find out) which animals are used for research and cover them, yet also to decide, as in the regulations, not to cover certain animals that are in fact so used!

As it turned out, not surprisingly, the animals covered were ones that aesthetically appeal to members of the public. As one USDA Inspector said to me in the 1970’s, he could bring charges against a researcher or dealer who “abuses” a dead dog, yet is powerless against a scientist who is biting the heads off mice and spitting them into garbage cans.

In tandem with this most ethically unsound definition of “animals” came a very restricted notion of the scope of the Act:

The Secretary [of Agriculture] shall establish and promulgate standards to govern the humane handling, care, treatment and transportation of animals by dealers and research facilities. Such standards shall include minimum requirements with respect to the housing, feeding, watering, sanitation, ventilation, shelter from extremes of weather and temperature, separation by species, and adequate veterinary care. The foregoing shall not be construed as authorizing the Secretary to prescribe standards for the handling, care, or treatment of animals during actual research or experimentation by research facility as determined by such research facility.<sup>8</sup>

In other words, the Act is to assure research animal welfare without prescribing standards for “handling, care, or treatment during actual research or experimentation.” This is relevantly analogous to a sex manual that covers foreplay but disavows concern with anything having to do with sexual intercourse. In 1970, the Act was amended to include assurance of proper use of anesthesia, analgesia, and tranquilization by the research facility during an experiment. However, the absurdity therein was that the regulatory requirement could be met by the research facility affirming in its annual report that it saw no need for anesthesia, analgesia, or tranquilization, even if performing painful research.

## THE EMERGENCE OF MEANINGFUL ETHICAL CONCERN

My own involvement with both animal research issues and animal ethics began serendipitously during the mid-1970's, when I negotiated with the Colorado State University (CSU) Veterinary School to teach the world's first course in veterinary medical ethics. A number of faculty members felt that society was rapidly changing in ways that had major implications for veterinary medicine, and asked me to help articulate and teach these new currents. At about the same time (1976), CSU hired a new Director of Laboratory Animal Care, David Neil, who shared the faculty's belief that society was rapidly changing with regard to animal issues. He also believed that both ethics and science demanded the articulation of new social ethical rules, in the form of laws, assuring that laboratory animals were provided with proper treatment. With Dr. Harry Gorman, eminent researcher and surgeon, a founder of the College of Laboratory Animal Medicine and head of the aerospace program use of animals, we formed a group rather naively chartered to draft exemplary legislation for laboratory animals in the state of Colorado. We were convinced that we possessed the necessary expertise—significant research experience, laboratory animal medicine, and ethics—to articulate the issues and push the discussion forward.

In our informal distribution of labor, it fell to me to articulate the emerging social ethics for animals, if only to gauge what was socially practicable. This task meshed perfectly with my veterinary school charge. Between 1976 and 1980, I struggled with the question of what one working to articulate animal ethics could use as a philosophical basis that could garner a consensus in society. I knew that I was free to argue, for example, that invasive animal research was thoroughly morally wrong, but that did not seem to be capable of leading to viable results that could move the issues forward. Given human moral psychology, it was clear to me that articulating such a frontal attack on animal use would elicit a defensive response, and close down dialogue that could lead to improving the situation of laboratory animals. But since a major portion of my veterinary school job developed into catalyzing changes in animal use sanctified by custom and tradition that were nevertheless seen as abhorrent by society—for example, repeated use of pound animals to teach surgery up to 15 or 20 times with very little aftercare—I had, as it were, something of a laboratory for testing my hypotheses both about emerging animal ethics and effecting changes in people (namely, faculty) inured to

using animals in ways dictated by convenience and little ethical thought.

In this way, I developed my own approach to animal ethics, deploying it on the veterinary faculty to change odious animal uses, and testing those results on the public. I basically assumed that concepts that worked in the context of changing animal use in veterinary education could be exported to laboratory animal use in general. In working to effect the abolition of “multiple survival surgery” (as described in the preceding paragraph), I recognized that one of Plato’s insights regarding ethics was astonishingly applicable: when dealing with attempts to change ethics in adults, one could not teach, but only remind. One needed to deploy *judo*, not *sumo*, to turn an opponent’s own force or ideas back on them.

Had I told our surgery faculty that they were sadistic monsters for doing multiple procedures, all dialogue would have shut down. But when I instead asked them if that was the only way to teach surgery, they responded by saying, “Do you think we like doing this? We did not go \$75,000 into debt for our education to cut on an animal over and over for convenience or money saving!” Soon they actually asked me to work with them in finding an alternative approach.

It was plain to me then that such a strategy for effecting ethical change was operative as much on a social level as on an individual one. In other words, after carefully studying empirical manifestations of increasing social concern for animal treatment, I began to see in what ethical direction society logically needed to go if it were to raise the perceived moral status of animals.

As mentioned earlier, society historically enjoyed no social consensus ethic for animal treatment except for proscribing deliberate cruelty. The new animal uses eliciting ever-increasing concern in society were industrialized agriculture and animal research and testing. But neither of these uses was conceptually captured by cruelty, and were in fact exempt from the cruelty laws. I thus realized that, lacking a precedent for animal ethics fitting new animal uses, yet increasingly demanding such ethics, society would inevitably move to “recollecting” its ethic for humans and applying it, more or less, *mutatis mutandis* to animal treatment.

What part of our social consensus ethic for humans lent itself to such modification? A concept very prominent indeed in the 1960’s and 1970’s! Every society faces a fundamental conflict of two goods: the good of the group (as a whole or the majority) versus the good of the individual. The former is, of course, the basis of utilitarian ethical

theory; the latter of certain kinds of deontological ethical theory. Though philosophers tend to treat these two approaches as mutually exclusive and incompatible, our democratic constitutional social ethic attempts to balance them. Although we make most of our social decisions by reference to the general welfare, we protect the individual person from being submerged by the general welfare. These protective fences built around fundamental aspects of human nature are called *rights*, as enumerated in the Bill of Rights and deductions therefrom, and check the utilitarianism that would allow sacrifice of such vital individual interests as speech, religion, travel, maintaining one's property, and protection from torture. Thus we are not allowed to torture a bank robber who has stolen the life savings of an entire community and refuses to reveal where he has stashed it.

It seemed obvious to me that if society wished to continue to use animals for food or research, as it seemed to, it would still not wish to allow animal interests to be totally submerged. (It is important to stress, of course, that society's wishes do not constitute or entail a rational basis for the moral rightness of such use. Rather, a pragmatic approach seeking to use social consensus as a basis for progress must remain grounded in what society is likely to accept in the way of social changes.) In 1964, the British Brambell Commission examining confinement agriculture declared, for example, that morally justifiable agricultural systems needed to respect animals' basic needs and natures even while we used them. Thus it seemed clear that the 20<sup>th</sup>-century revolutionary changes in animal use would provoke in society a demand for checks on consequentialist appeals to human benefit or, more simply, for legal protections or rights for animals, in the absence of the natural fair contract represented by husbandry. (Sure enough, due to increasing social demand, laws protecting animals have gone from virtually none in the early 1970's to literally thousands today on the state, local, and federal levels.)

Armed with this philosophical framework, our legislation-writing group saw its task as creating moral checks on animal use in research, the most important of which was the legally mandated control of pain, if animals were to be used in ways causing pain. Further, the approach to legislation seemed to follow logically and in accord with common sense: If animals were not getting the best treatment possible consistent with their use in research, indeed if poor treatment was sometimes even compromising research by introducing uncontrolled stress and pain variables, we had a societal opening to pass between the horns of (1) those in the research community who insisted on no

constraints on the use of animals in research, and (2) those animal advocates who would forbid research altogether. Society as a whole, we surmised, was in the middle on those matters.

From 1976 until 1980 we drafted this model legislation until finally we came before the Colorado legislature, where we quickly failed. In retrospect, we realized our naiveté when we were approached by Representative Pat Schroeder, who pointed out that such legislation could not possibly work in only one state, but needed to be federal, and offered to carry it up for us in Congress.

We learned much in the ensuing five years until the bill passed. In the first place, and contrary to our expectations, we learned that the research community absolutely and completely opposed any legislative assurance of proper animal treatment. There had already been a long tradition in the medical research community of seeing anyone raising questions about the ethics of animal use as an “anti-science, anti-human, anti-progress, anti-vivisectionist.” Thus, for outlining the legislation in a book, I was called a “Nazi and a lab-trasher” in the *New England Journal of Medicine*.<sup>9</sup> The scientific community seemed to regard us as hell-bent on stopping medical progress. Only gradually did I learn that scientific thought was guided by a powerful and immovable ideology declaring science to be “value-free” in general and “ethics-free” in particular, an offshoot of rampant Logical Positivism (a philosophical school that dichotomized empirical assertions and assertions of value, declaring only the former to be meaningful). Furthermore, this ideology required agnosticism about animal thought, feeling, consciousness, or pain, as empirically unknowable. Ironically, opponents of animal research attacked us equally vigorously, in one paradigm case calling me a “sell-out” for “accepting the reality of science.” (The latter stems from a radical viewpoint according to which animal abuse cannot be remedied incrementally, but requires revolutionary change. Famed activist Henry Spira, though an abolitionist vis-à-vis animal use, nonetheless pointed out that all social revolution in the history of the U.S. have been incremental.)

We were quite secure in our belief that we had seized ground that society in general would support, namely assuring more humane treatment for laboratory animals. Nonetheless, we were told explicitly that we had an uphill battle, if only because the medical community had such a powerful lobby opposed to us. We needed to justify, persuasively and painstakingly, every provision we proposed to make mandatory.

At the root of our laws was control of pain and of distress, the latter encompassing such negative emotional states as fear, loneliness, and boredom. We also mandated that if a procedure would hurt humans, it could be presumed to hurt animals. The research community outrageously claimed to control pain already. We proved this false by doing a literature search on animal analgesia in 1982 when I went before Congress. What did this literature search reveal? Two papers, one of which said, “there ought to be papers.” Such evidence of neglect of pain control could not be ignored.

Second, in addition to mandating pain control, the legislation we proposed was intended to break the hold of agnosticism about ethics and mental states among scientists. We did this by requiring animal care and use committees, which would include both scientists and non-scientists, to review prospectively all protocols, discuss them in terms of proper numbers of animals, pain and suffering, design, species, etc. Such mandated discussion, we felt, would help ideology crumble—and it did. Committees also reviewed all teaching and inspected facilities and protocols.

Third, we proposed in our bill that all laboratory animals (including rats and mice, historically excluded from the Animal Welfare Act) be housed and kept in ways that met their biological and psychological needs and natures. Unfortunately, Congress was unwilling to grant this, instead only mandating exercise for dogs and environments for non-human primates that “enhanced their psychological well-being.”

Other provisions included the following: No paralytic drugs were to be used without anesthetics. Multiple surgery was prohibited unless justified to test a single hypothesis. An animal welfare information service was established at the National Agricultural Library. Research facilities were required to institute and oversee training for researchers and staff on humane practice and experimentation.

In addition, The USDA (which enforced the Animal Welfare Act and these Amendments) was to share efforts with NIH. Beginning in the 1960's, The NIH had developed good guidelines for proper care and use of laboratory animals, but had failed to enforce them. These NIH Guidelines were in fact turned into law at the same time as our Amendments passed in 1985. Both of these laws went into effect in 1985.

Virtually all vertebrate animals used in research were covered by one or another of these laws, though, in a very reactionary move, when the USDA was planning to include rats and mice under the

Animal Welfare Act, the chief biomedical research lobby group, the National Association for Biomedical Research (NABR), convinced Senator Jesse Helms to sponsor legislation in 2002 declaring rats and mice not to be animals for the purposes of the Act. Gratifyingly, by then such a move was not very popular with the scientific community, as many scientists felt it made them look ridiculous in the eyes of the public. Nevertheless, it prevailed.

The laws, and particularly the regulations interpreting them, established by Animal and Plant Health Inspection Service (APHIS) and to a lesser degree by NIH, are far more complicated than our thumbnail sketch might suggest. For example, there are detailed rules concerning surgery, veterinary care, psychological well-being, etc. But, conceptually at least, we now know enough to understand why these laws are indeed revolutionary breakthroughs in animal ethics.

In the first place, some of the above-mentioned absurdities manifest in the 1966 laws have been largely corrected. Although the 1966 claim disavowing any legal control over the actual conduct of research still remains, the procedures mandated clearly belie that claim. Similarly, although the Animal Welfare Act amendment and the Helms law deny legal protection to rats and mice, the NIH law covering all federally funded institutions does cover them in most settings, though there are still some exempted contexts. Farm animals used in biomedicine are clearly covered, and many Animal Care and Use Committees demand biomedical-level control of pain even in agricultural research. Many committees have also applied pain control rules to invertebrates like the cephalopods, where there is excellent scientific reason to believe pain (and even distress) are present.

Additionally, the laws have significantly eroded the ideology that creates a radical cleavage between ethics and science. Protocol review is inherently replete with substantial ethical discussion, which inevitably becomes more and more sophisticated with time. When my own institutional committee began in 1980 (voluntarily—to show Congress such a system could work), we covered up to twenty protocols in a ninety-minute meeting, including time to eat lunch and schmooze. Now, judging the same number of protocols consumes 3–4 hours, and a single controversial protocol can cover a single meeting.

Moreover, scientists on committees understand that the current system is their last chance at self-regulation, and that loss of federal funds for the whole institution can be a penalty for not obeying the law. The result is that more and more scientists are taking issues of

animal care and use very seriously, and there is growing committee hostility to that handful of researchers who try to get around the system. Friends of mine at NIH even told me that within five years of the law going into effect in 1987, several Committees were discussing cost/benefit issues in terms of animal suffering, even though the law does not mandate such discussions. Though most protocols are not rejected, many are modified to the benefit of animals. The biggest problem remaining with the laws is that primacy is still given to the science being done, not to animal welfare. We shall discuss movement in the direction of rectifying this imbalance shortly.

It is also obvious that, from their inception, the laws have eroded and displaced ideological denial of animal mentation, particularly pain. Given that knowledge of and concern for animal pain was almost non-existent when the laws passed, the USDA wisely concentrated on enforcing control of pain. It is only in the past year or so, now that pain control is solidly established, and the vast majority of young scientists and graduate students acknowledge pain in animals as axiomatic, and the literature on animal pain has become vast and increases geometrically, that USDA has mentioned—as a word to the wise—that it will start monitoring “distress,” even though, as was the case initially regarding pain, people are stumbling in the dark.

In drafting this legislation, our group was adamant that the role of the law should be analogous to what Wittgenstein said of his philosophy—an educational ladder that allows or rather compels scientists to transcend their previous agnostic position regarding the ethics of research and the pain and distress of animals, and negotiate routinely in what was historically *terra incognita*. Given that the law has been in effect for less than 20 years, our goal seems well on the way to being achieved. Ultimately, we hoped to produce a generation of scientists to whom what are now legal stipulations are second nature, and who have reappropriated common sense and common decency.

Some years ago, at an American College of Laboratory Animal Medicine (ACLAM) convention where I gave the keynote address, I debated a famous scientist who argued that these laws did not work. His evidence? Some of his own protocols were turned down by his institutional committee as involving too much pain. He seemed adamant on this point. Seven years later, I ran into the laboratory animal veterinarian charged with insuring compliance with the law at his facility, who informed me that the researcher in question now saw

the law as essential to scientific activity, and as reflecting legitimate social concern that needed to be respected.

He is correct. The social furor of distrust that reflected public distrust of scientists' treatment of animals in 1970's and early 1980's has diminished. There is no question that People for the Ethical Treatment of Animals' (PETA) and other activists' revelations about Taub's mistreatment of baboons (1981), the atrocities at the University of Pennsylvania head injury laboratory (1984), the misconduct revealed at the research facilities of the City of Hope (1985), all fueled the passage of our laws. Indeed, Henry Waxman told me when I testified before his committee in 1982 that even though our bill would be defeated that year in deference to the medical research lobby, it would most certainly pass within two or three years, because rarely did Congress experience such univocal public concern about an issue. And, correlatively, it is clear that the passage of the law blunted constant media coverage of research atrocities and animal misuse, though occasional flares still emerge, particularly in the area of primate use.

To use the famous language of Russell and Burch regarding alternatives to animal use,<sup>10</sup> we may recognize three alternative approaches: Replacement of animals by non-animals, Reduction in numbers of animals, and Refinement in animal use. In the short run, the laws have most obviously affected reduction, by focusing researcher attention on previously neglected statistical precision. (To be fair, though, committees may see the animal sample as inadequate and demand more animals.) One member of our committee articulated the law of animal numbers, wherein our committee often reduced the numbers of animals in protocols involving cheap animals cared for inexpensively, such as rats and mice, but had to increase the numbers when statistically similar research questions were asked about horses and other animals expensive to buy and care for!

Even more than reduction, perhaps, the laws have focused refinement of procedures, notably by demanding early end points and precise end points decided in advance. Whereas researchers used to use death as an endpoint in disease studies, a point that can involve significant suffering, today the researcher must specify the earliest possible moment of termination. Similarly, whereas in the 1970's I saw tumors grown in animals larger than the animals, tumor size is strictly limited and small.

Animal activists, however, favor replacement of animals as the most desirable alternative. Unfortunately, replacement is difficult,

requiring both significant money for research and equally significant amounts for validation. Science tends to be conservative, and demands what it considers full proof of the viability of an alternative before replacing animals as the historical “gold standard” whether they are or not. That is not to say the laws have not pushed replacement at all. Particularly in teaching, invasive animal use, especially use involving suffering, is a thing of the past. Whereas once we did multiple survival surgery and poisoning of animals, even terminal surgeries for teaching are declining, and committees are increasingly asking “Why can’t you film it?” A famous example is hemorrhagic shock labs where medical and veterinary students were forced to bleed animals out and watch the stages to death. Today such labs, once ubiquitous, have been replaced by films or computer simulations in most medical and veterinary schools.

In short, the laws have provided an ongoing mechanism for the scientific community to reflect both on what it does and what society thinks about it in ethical terms. Having said all this, it is necessary to sound a cautionary note and address the fact that the laws are far from perfect. At best, they represent the first real steps of ethical evolution in thinking about animal research, which, in the light of previous history, is not a trivial point.

#### INADEQUACIES IN THE LAW—AND EVOLUTION IN ETHICS AND REGULATION OF ANIMAL RESEARCH

Despite the real progress in these laws, they are only steps on the way to a full-blown social ethic for laboratory animals. There are some implicit assumptions underlying these laws that are at least morally questionable in today’s society, if not down right unacceptable. One such assumption is that the importance of the scientific question being researched on animals takes precedence over the welfare of the animals. This assumption is built into the prohibition against committees rejecting certain research as being too invasive to perform (though, as we mentioned, some committees do on occasion exceed their statutory authority and reject certain research). In a showdown between good science and animal welfare, good science will usually take precedence. Hence the extant provision from the original Animal Welfare Act affirming that these laws are not intended to infringe on the design or conduct of research except in the specific ways enumerated.<sup>11</sup> It is by no means clear that society as a whole would say

this, and there is no doubt that very many citizens would be prepared to dispense with certain scientific advances if they could only be achieved at the expense of great suffering. There is in fact some research that I am sure most citizens would reject because there is far too much suffering occasioned to balance the benefits. In fact, a survey commissioned by the Humane Society of the United States shows that public support for animal research declines in direct proportion to how much the animal suffers to gain that knowledge.<sup>12</sup>

Thus I have no doubt that many if not most citizens would approve of painless killing of many mice to cure cancer, or even of the painful death of 1000 rats if we were pretty certain of a cancer cure resulting as a consequence. But when a researcher blinds 1000 hamsters to study circadian rhythm, I seriously doubt most people would approve, given the lack of any demonstrable human health benefit.

At the moment, the scientific community justifies invasive animal use by citing the human and/or animal benefits that result from such use. In the current system, the scientific community ultimately judges both cost and benefit; animal care and use committees exist to assure that everything possible that can be done to mitigate suffering is in fact being done. Much research on animals is done with public money. That which is done by private money is still allowed to go forward in the public arena because people implicitly trust the scientific community's cost/benefit assessment. In the face of these points, it would be reasonable to allow committees to judge whether a given piece of research should be done at all, not just how it should be done. The degree of suffering allowed to be inflicted on other creatures should be judged by society in general, since the question at issue is inherently a matter of social ethical judgment, not merely the judgment of those who have a vested career interest in the outcome. If what results from an experiment on animals is worth the animals' suffering, ordinary people should be able to see that balance clearly and unequivocally.

Thus, because the justification of animal research depends on social moral decision, it seems appropriate that those adjudicating that decision should be representative of society in general, in whose alleged interest the invasive manipulation is to be done, rather than dominated by representatives of those whose personal careers and futures depend on doing those manipulations regardless of actual social value. This is a fortiori true when the research is funded by tax money.

In other words, the next reasonable step in creating morally sound laboratory animal laws would be requiring that decisions to permit

invasive animal research be made by those who will *allegedly* benefit from it, rather than on those who clearly stand to gain from more research being done. To the claim that ordinary people could not make such a judgment, I would reply that, even if they find it difficult, scientists are capable of explaining what they want to do and why. Further, it is far more respectful of citizens' autonomy in a democracy to allow them to decide for themselves what activities are to be conducted in their names. People should at least be allowed to directly affirm, "I will not accept this amount of animal suffering as a cost of this amount of human health improvement or increase in knowledge."

Such a system would be a major moral step forward. But a doubt remains that public sentiment would necessarily give priority to animal interests. In addition, there are other difficulties in the current system that could render it even less effectual than it currently is. A key feature of the current laws is prospective review of suggested animal studies by committees—an examination of the hypothesis proposed, what is to be done to test the hypotheses and the degree and nature of resulting suffering, as well as modalities for its control. But more and more, as biology is increasingly based in molecular genetics, this old model is being superseded. Much of today's research doesn't allow plausible prediction of what the experiment will affect. For example, ever-increasing amounts of molecular biology involve gene or sequence ablation, or gene or sequence addition or insertion. No one has the foggiest notion of what phenotypic results such insertions or ablations will engender. So committees really cannot predict what impacts on welfare such manipulations may engender.

As one of my friends at a major medical school put it, very few schools can keep up with the nature of the new "try it and see" approaches to molecular biology. Only those schools with large numbers of post-graduate residents already trained in laboratory animal medicine who can tour laboratories to catch unexpected results engendering pain and/or suffering for the animals can do it. In other words, if we lack the ability to anticipate phenotypic effects of genetic manipulations, controlling pain and suffering in a timely way becomes very labor intensive and correlatively cost-prohibitive.

It is also plain that society has grown increasingly sensitive to animal suffering, and protocols acceptable or at least unquestioned twenty years ago can become today's scandals, capable of damaging an institution as considerably as the University of Pennsylvania head injury studies did to that University in 1984. A case in point occurred at Tufts University Veterinary School in 2004. An animal care and

use committee carefully examined a protocol that involved fracturing young dogs' legs and repairing the fractures with two different sorts of external fixation apparatuses. The committee and the veterinary staff worked tirelessly to minimize the animal pain and distress, and succeeded quite well. Yet the general public, the student body, and the mass media were horrified at deliberately fracturing the limbs of young dogs regardless of the benefit. In other words, certain manipulations on certain animals are socially unacceptable, period. And this is likely to be a moving target, both in terms of kinds of animals and in terms of kinds of manipulations. (In Britain, for example, learned helplessness studies have been banned for years; not so in the U.S., though they ought to be.)

The issue of research that oversteps the bounds of decency is certainly a social ethical issue about which current laws are silent. The Dean of Veterinary Medicine at Tufts agonized over this issue for a long time and finally instituted an additional level of oversight not embodied in the federal laws. On his proposed model, senior administrators can flag certain protocols as not morally acceptable in their context, regardless of how they are done or what benefit they produce, except under conditions of national emergency for humans (such as AIDS) or animals (such as parvo-virus).

How such additional oversight will work, whether researchers will accept it, how it will stand up to legal challenges all remain to be seen. But it does evidence the probable next step in law and ethics that society will demand, wisely foreseen by a thoughtful and prescient administration.

A second example of going beyond current law helps to solidify our point. A good friend of mine recently became senior administrator at a very influential research foundation devoted to pets. One of her first concerns was her discovery that the foundation funded significantly invasive research. She found this morally, politically, and pragmatically disturbing: How could a group specializing in the well-being of dogs, cats, and other animals do invasive research on them? She asked me for help in talking to the Board of the group.

I did so, and argued that there was much possible non-invasive research that could benefit animals, for example, certain types of behavioral research. (The largest single cause of death for pets is euthanasia for behavioral problems.) I also explained that groups like the American Kennel Club already refused to fund invasive research. The group concurred and the foundation's policy now allows for invasive research only in emergency situations.

Finally, a more adequate ethic for research animals would address the physical, social, behavioral, and psychological needs of research animals—what I have elsewhere called providing living conditions that accommodate their *telos* or nature, as we decreed in our original draft bill. Only 10 % of research animals are used in invasive, painful protocols involving unrelieved pain;<sup>13</sup> 100% of such animals are kept in conditions that violate some aspects of their nature. To cite some glaring examples, nocturnal animals are kept in 24-hour daylight; social animals are kept isolated; burrowing animals are kept in polycarbonate cages. I strongly believe that just as uncontrolled pain affected the quality of research, so too does violating animal nature. But in the end, the justification for not only avoiding miserable lives for research animals, but actually trying to create happy lives is a moral one—calling us back to the hard moral fact that research on captive animals is irreducibly morally problematic.

### ACKNOWLEDGEMENT

I would like to thank David DeGrazia for helpful suggestions in the development of this article.

### NOTES

<sup>1</sup> See Rod Preece, *Awe for the Tiger, Love for the Lamb: A Chronicle of Sensibility to Animals* (New York: Routledge, 2002); and *Brute Souls, Happy Beasts, and Evolution* (Vancouver: UBC Press, 2005), passim.

<sup>2</sup> Rod Preece and David Fraser (eds.), *Dix Harwood's Love for Animals and How It Developed in Great Britain* (Lewiston, NY: Edwin Mellen, 2002; first published 1928).

<sup>3</sup> *The State v. Bogardus*, 4 MO. App. 215, 219 (Mo. Ct. App. 1877).

<sup>4</sup> *Waters v. the People*, Supreme Court of Colorado 23 Colo. 33, 46, p.112; 1896 Colo.

<sup>5</sup> Bernard E. Rollin, *Farm Animal Welfare* (Ames, Iowa: Iowa State University Press, 1995), passim.

<sup>6</sup> Richard French, *Antivivisection and Medical Science in Victorian Society* (Princeton: Princeton University Press, 1975), passim.

<sup>7</sup> Dogs, Cats, and Other Animals; Research or Experimental Use; Laboratory Animal Act of 1966 AKA Animal Welfare Act, Federal Laboratory Animal Welfare Act AKA Animal Welfare Act, Animal Welfare Act, August 24, 1966; 89 P.L. 544; 80 Stat. 350.

<sup>8</sup> 7 USCS § 2131 Title 7. Agriculture, Chapter 54. Transportation, Sale, and Handling of Certain Animals, § 2131. Congressional statement of policy, United States Code Service.

<sup>9</sup> M.B. Visscher, review of *Animal Rights and Human Morality*, by B. E. Rollin (Buffalo: Prometheus, 1981), *New England Journal of Medicine* 306 (1982): 1303–1304.

<sup>10</sup> W.M.S. Russell and R.L. Burch, *The Principles of Human Experimental Technique* (London: Methuen, 1959).

<sup>11</sup> See number 7 above.

<sup>12</sup> The Humane Society of the United States, Survey conducted for The HSUS by an independent polling firm, which interviewed 757 Americans nationally on September 23, 2001: [http://www.hsus.org/animals\\_in\\_research/pain\\_distress/opinion\\_poll\\_on\\_pain\\_and\\_distress\\_in\\_research.html](http://www.hsus.org/animals_in_research/pain_distress/opinion_poll_on_pain_and_distress_in_research.html).

<sup>13</sup> USDA-APHIS, personal communication March 1, 2005. (This figure does not include rats and mice, for whom there are no statistics, since rats and mice are not covered by the Animal Welfare Act.)

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